

## In Search of the Optimal Rapid Response System Bundle

Matthew M. Churpek, MD, MPH, PhD, Dana P. Edelson, MD, MS\*

Department of Medicine, University of Chicago, Chicago, Illinois.

The theory behind rapid response teams (RRTs), namely to provide critical care resources to patients with clinical deterioration on the wards, is such common sense that failure to do so seems unethical. This idea, combined with evidence that many cardiac arrests on the wards are predictable and potentially preventable events, led to the proliferation of RRTs across the country and a Joint Commission mandate.<sup>1</sup> However, data from clinical trials have failed to consistently confirm the value of these teams, likely a product of the wide variability in implementation practices across institutions.<sup>2</sup>

In this issue of the *Journal of Hospital Medicine*, Davis and colleagues demonstrate improvements in both mortality and cardiac arrest rates outside the intensive care unit (ICU) following implementation of their rapid response system in 2 hospitals.<sup>3</sup> Although several other studies have shown similar results, what makes this implementation unique is the bundle approach that included proactive rounding by the charge nurse from each unit, annual focused training of team members and staff, and an integrated, continuous, quality-improvement feedback loop. Bundles are common in successful quality-improvement work, but can be challenging for deciphering which of the individual components are driving the results, leaving readers to venture an educated guess. In the current bundle, the novel use of the charge nurse has some significant appeal as a candidate primary driver of the impact, because it likely had 2 distinct actions: (1) proactive rounding and (2) promoting a culture change, both of which are well supported in the literature.<sup>4,5</sup>

Several studies, including this one, have demonstrated a dose-response association between the number of RRT activations and patient outcomes, with a low number of RRT activations deemed a major contributor to the neutral results of the large multicenter, randomized, controlled MERIT trial.<sup>6,7</sup> Additionally, delays in treatment and transfer to the ICU for unstable patients are known to increase mortality.<sup>8</sup>

One way to increase the number of patients seen by the RRT and decrease activation delays is by instituting proactive rounding by the team on high-risk patients. This was the strategy employed in a landmark ward-randomized trial by Priestley and colleagues, which demonstrated a significant improvement in mortality from proactive rounding on patients deemed to be at high risk of clinical deterioration as calculated by an early warning score or due to caregiver concern.<sup>4</sup>

Identification of at-risk patients for proactive rounding can be accomplished with gestalt, as was done by the charge nurse in the current study, or using specific individual criteria such as recent discharge from an ICU. Alternatively, this can be accomplished using composite vital sign-based risk scores, such as the Modified Early Warning Score (MEWS).<sup>9</sup> Recently, several newer algorithms that integrate vital signs, laboratory data, and demographics have been shown to outperform the MEWS.<sup>10,11</sup> Such systems promise an exciting age of real-time computer-generated risk stratification, with the ability to automate and standardize the selection of patients for proactive rounding across institutions.

Interestingly, the selection of the charge nurse, rather than someone who did not reside on the unit, to conduct the surveillance rounds likely had another benefit: expediting and facilitating the culture change necessary for a successful implementation. The integration of the charge nurse into the RRT likely led to a local reinforcement of important cultural changes that were already happening at the institutional level. It is clear that culture change is essential in any quality improvement endeavor, and previous literature on RRTs supports this notion.<sup>5</sup>

Rapid response systems are complex and include the activation criteria, team composition and training, and an administrative component. A multifaceted, bundled approach is likely to be required for success. Furthermore, regardless of what risk stratification criteria are used, proactive rounding on high-risk patients is likely to increase the yield. Utilizing the charge nurse in that effort is a creative use of a preexisting local resource and is worthy of future study.

\*Address for correspondence and reprint requests: Dana P. Edelson, MD, University of Chicago Medical Center, Section of Hospital Medicine, 5841 South Maryland Avenue, MC 5000, Chicago, IL 60637; Telephone: 773-834-2191; Fax: 773-795-7398; E-mail: dperes@uchicago.edu

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